

RESOURCE INVENTORY

State forests and forest recreation areas will conduct inventories to survey resources, and develop management guides to identify and guide management activities. There are several inventory methods covering a variety of resources. State forest trees have generally received the most intensive inventory work. Inventories will be conducted on all tracts, including those with intensive recreation facilities.

Forest Inventory

Most of the properties had a property-wide timber inventory conducted in the 1980s. These were conducted to determine allowable cut and growth rates. For two properties, Clark and Owen-Putnam, the information was gathered intensively enough to be used at the tract level. The others are good only at the forest or compartment level. Each forest had a different scheme used, except the CFI plots are Martin and Ferdinand.

Property wide inventories were completed in 2005 that used the same methodology on all the state forests, except for Ferdinand and Martin, which had CFI plots.

Continuous forest inventory (CFI) plots have been established and maintained on some properties. These supply property-level information. They provide the opportunity to document the changes at specific sites over time. These have been used just for timber measurements. But they do have the capability of being expanded to include other resources such as herbaceous cover. These provide an excellent source for overall assessment of forest condition. The Martin CFI plots were remeasured in 2005, and the Ferdinand CFI plots were remeasured in 2003.

Beginning in the November 2007, CFI plots were placed on all properties with sufficient intensity to measure some forest attributes at the compartment level. CFI plots are permanent plots that will be revisited and measured at 5-7 year intervals

Tract Inventory

The most common inventory performed is the tract timber inventory. While timber is a primary goal of this inventory, this inventory also gathers information about other forest resources for their management. This inventory is most often conducted to create a tract management guide and prescription. It utilizes the Two Dog or TCruise inventory computer programs. Field information is entered on the tally sheet. Information collected includes species, diameter, and height.

The sampling method for the tract timber inventory is systematic horizontal point sampling with a random start. The plots will be variable radius using a 10-factor prism or 20-

factor prism.

The formula found in the appendix, $n=10+(2.5 \times A-10)^{1/2}$, will be used to determine the appropriate minimum sample plots for a tract inventory using 10-factor prism. The sampling intensity must be one plot per five acres (7-chain X 7-chain grid) at the minimum (usually for very large tracts). Tracts below 51 acres in size will be sampled at the one plot per two-acre intensity. Very small tracts may require sampling as high as one plot per acre. One consideration in the intensity of the sampling is the homogeneity of the tract. Tracts that are very homogeneous in species, size, aspect, community types, and terrain can be sampled at a light intensity. Tracts that have a mix of these features should be sampled at a high intensity to ensure adequate representation of distinct areas or stands. Another consideration in sampling intensity is the use of the information. Sampling an area for a simple overview may only require a light intensity. Light intensity sampling is more likely to miss many of the other resource features. Sampling an area to come up with figures for a timber harvest tally or for TSI estimation requires high intensity sampling. The factor for verifying whether border trees are in for a 10-factor prism is $D = 33 \times \text{DBH}$. That is the tree is in if the distance to the center of the tree is equal to or less than 33 times its DBH. Two Dog Method 1 (fielddog.mt1) is the method for 10-factor cruising.

Using a 20-factor prism, the same formula above can be modified to $n = 1.1 \times (10 + (2.5 \times A - 10)^{1/2})$ to determine the number of plots. Basically, using a 20-factor prism will require the need to take 10% more plots than a 10-factor prism. So a 30 plot inventory using a 10-factor prism would become a 33 plot inventory using a 20-factor prism. But since the number of trees measured at each plot is less, there should be some time savings even with the additional plots over a 10-factor prism inventory. Because of the amount of variability with in trees that can occur plot-to-plot with a 20-factor prism, it cannot be used as handily as a 10-factor prism to estimate stand basal area. Because fewer trees are measured, each tree measured and each borderline tree has greater impact for the results. Extra care should be taken to ensure the in or out status of borderline trees. The factor for verifying whether border trees are in for a 20-factor prism is $D = 23.33 \times \text{DBH}$. That is the tree is in if the distance to the center of the tree is equal to or less than 23.33 times its DBH. Two Dog Method 4 (fielddog.mt4) is the method for 20-factor cruising

Even though 20-factor prism cruising will require ten percent more plots, there should be some time savings over a 10-factor prism cruise since on the average only half the number of trees are measured on each plot. So time spent at each plot should decrease. Time traveling between plots should increase by 10% since there are 10% more plots.

All state forests and forest recreation areas will develop a regular schedule of tract inventories and management guide development. All tracts will be included in this schedule and will be inventoried regularly, including those with nature preserves, old forest areas, and recreation areas. All portions of the tract will be inventoried, including regeneration openings, pine stands and old fields. The purpose of the inventory is to obtain a picture of the tract and the areas within the tract. State forest and forest recreation area staffs will coordinate inventories

and management guide development for tracts that affect forest recreation areas. Inventories and guides on tracts that affect forest recreation areas will be incorporated into the schedule for adjoining state forests. Tracts containing recreation facilities, lakes and other non-timber features will be included in the schedule. The condition of all resources on the properties requires regular monitoring. For example, trees and other vegetation in recreation areas receive considerable stress that can result in rapid decline.

The plot center is located by pacing according to the selected grid. At the plot center, the prism is used to determine which trees are in the plot. It may be necessary to take distance measurements to borderline trees to determine status in or out of plot. Trees in the plot are then measured. Information taken includes species, tree class, DBH, merchantable height, and percent sound if a deduction is appropriate. Information will be taken on all trees, living or dead, that are considered in the plot.

While tree condition is a primary feature assessed in the inventory, there is other important information needed to get as complete a view of the tract as possible. On each sample plot visited, or during the travel between plots, there is other observational information that should be gathered to assist with the management guide. This information includes aspect, slope position, gradient, geologic features, topographic features, water features, cultural resources, man-made features, primary understory vegetation, wildlife sign/habitat, access, and property line/survey features. Plot information should include basal area, timber type, timber size class, and ecological landtype phase (if known).

The timber inventory information is processed by using the Two Dog or TCruise inventory program. Form TM901, the Resource Management Guide, is filled out using the inventory information and placed in the appropriate tract file. The Tract Summary (TRACTSUM) database is updated. The inventory completion is noted on the Compartment Accomplishment Record. Timber inventories can be used for planning timber management activities for up to seven years after completion of the inventory. After that time period, a new inventory is required. A timber management activity will be considered to have fallen within the seven-year period as long as it begins within the period. For an individual timber harvest, this would be the start of the marking. For an operation that had a harvest followed by TSI, this would also be when the harvest marking begins.

Other Inventories

The Division of Nature Preserves (DNP) is assisting with a natural areas inventory of the state forests. While not every portion of the property is examined, the entire property is reviewed for areas of probable interests. Maps, aerial photos and old sightings are used to help identify areas of interest. The areas are then examined on the ground, often several times during the growing season. These examinations may result in proposals for new nature preserves or recommendations to the property on special area management. Reports are generally provided by DNP and should be maintained in a natural areas file. Management recommendations for areas

will be noted in the appropriate tract file.

Fish inventories of fishing lakes may be done with the assistance of the Division of Fish and Wildlife. These are used to determine the quality of the fishery and to plan management activities such as stocking. Results should be maintained in a lakes, fisheries or appropriate tract file, and recorded in the Five-Year Fish and Wildlife Operational Guide Accomplishments Record.

Cultural resource surveys and assessments are done in cooperation with the Division of Historic Preservation and Archaeology. These are generally done on an as needed basis. An assessment and clearance is generally required for any management activity that causes ground disturbance or impacts structures or sites over 50 years old. Properties will perform inventories of historic sites, usually homesites. Information on the site (location map, artifacts, features) should be kept in the tract file, and entered into the Cultural Resources database.

Other special inventories will be needed on occasion. The design and use of the inventories will depend on the particular situation. These will be developed with the assistance of Central Office staff specialists.

Reconnaissances (recons) are quick observational inventories. These are used to quickly determine a particular feature or condition that does not need a specific sampling technique. Recons are often used to assess areas for future inventory needs or management activities.

Storm blowdown salvage may require special sampling techniques if measurement of all trees is not feasible. Fixed radius plots in a grid pattern can be used to estimate the number of trees and volume. Further information is contained in **State Forest Timber Sales**, or the Property Specialist can be contacted for further information.

Section Bullet Summary

- Property-wide forest inventories determine allowable cut and forest growth rates for properties as a whole, and provide overall baseline data. Continuous forest inventory plots also supply property-wide information from fixed, continuous plots.
- Tract timber inventories are the most common inventory used for forest management activities. Sampling intensity can vary depending on the use of the data, and the condition of the tract. Information is processed on the Two Dog or TCruise inventory program.
- State forests will have a regular inventory schedule for all tracts. Forest recreation areas will be included in the inventory schedule of the adjoining state forest.
- Tract inventories will include lakes, recreation areas, and administrative areas for full resource monitoring. State forest and forest recreation area staffs will coordinate inventories on forest recreation areas.

- Several inventories are done to gauge other natural or cultural resources.